Space Weather Forecast

Issued on Friday, 17 February 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: R1/R2 Radio Blackouts likely. G1-G2 Minor/Moderate Storms likely, mainly day 2 (17th), due to CME (coronal mass ejection) arrival.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Moderate solar activity was observed, with only two of the six sunspot regions appearing significant. The first is in centre disc and appears inactive despite a complex configuration. A region on the northeast limb is appearing to be increasingly complex as it rotates further onto the visible disc. Two regions which rotated across the western limb through the last few days may produce visible flares earlier in the period. Remaining regions are all weak or benign. A CME observed leaving the northwest of the Sun during 16 February has been analysed and is not considered to be Earth-directed.

Solar Wind / Geomagnetic Activity: Solar wind speeds have increased from background to elevated levels as the Earth entered a region of space affected by a fast solar wind. The observations may have been initially combined with the effects of a CME, but now appear to be solely observing the fast solar wind. The total magnetic field started strong but has weakened to moderate levels. The north-south component of the solar wind initially varied strong between positive and negative polarities, but has become weakly to moderately positive in the second half of the period. Geomagnetic activity was initially Unsettled to Active, with one G1/Minor Storm interval between 16/0600-0900 UTC (Kp 3-5), but became Quiet from 16/1800UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Moderate to Low activity is forecast through the next four days, with sunspots close to the centre disc and on the northeast limb presenting the most significant risk. Further significant sunspots may also rotate onto the visible disc during the period.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 15 February is due to arrive at Earth late on 17 February, with a margin of error of around 12 hours. Otherwise a a fast solar wind is continuing to affect the Earth on 17 February, perhaps easing later in the day. CME influences are likely through 18 February, perhaps easing on 19 February. A further fast solar wind is forecast to connect with the Earth on 20 February, with estimated speeds of 500km/s. Quiet to Unsettled geomagnetic activity at first on 17 February, with a low risk of further Active or G1/Minor storms. Active or G1/Minor storm intervals then more likely later on 17 February due to the forecast CME arrival, with this risk continuing, but then decreasing through 18 February. Quiet to Unsettled intervals likely to develop from 19 February, with further lower risk of Active or G1/Minor storms on 20 February.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels. There is a slight chance of count rates exceeding the S1/Minor radiation storm level in response to any significant flares that occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	60	30	5	10
Strong	G3	No	10	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.